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DUKE W. YEE YEE & ASSOCIATES, P.C. P.O. BOX 802333 DALLAS, TX 75380			EXAMINER VU, TUAN A	
			ART UNIT 2193	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/761,991

Applicant(s)

JAMISON, WILFRED CADELINA

Examiner

Tuan A. Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 5/7/07.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1,3-8,10,12-17 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10,12-17 and 19-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This action is responsive to the Applicant's response filed 5/07/07.

As indicated in Applicant's response, claims 1, 3-6, 10, 12-14, 17, 19-21 have been amended, and claims 2, 9, 11, 18 canceled. Claims 1, 3-8, 10, 12-17, 19-23 are pending in the office action.

#### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 5-8, 10, 13-17, 19, 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Coha et al., USPubN: 2003/0182597– now issued as USPN: 6,804,691 (hereinafter Coha).

As per claim 1, Coha discloses a method of improving performance in a Java computer application program executable by a Java Virtual Machine (e.g. Fig. 2A), comprising the steps of: obtaining information associated with garbage collection (e.g. Fig. 2A; para 0023-0031, pg. 2); and deducing changes in performance (e.g. Fig. 3; para 0040, pg. 3; Fig. 5; para 0069, pg.4; step 250 - Fig. 2B) that will result from modifying the Java computer application program; and

modifying the Java computer application program, wherein the cost of garbage collection to program performance is estimated using a duration of an average garbage collection event and a frequency of garbage collection events (e.g. para 0037, pg. 3; para 0058-0059; 0063, pg. 4).

**As per claim 3**, Coha discloses wherein the cost of garbage collection is reduced by reducing either or both of the duration and frequency ( e.g. *how much time was spent* - para 0039-0040, pg. 3; para 0069, pg. 4; para 0075-0077 – Note: tuning parameters based on garbage collection time usage reads on optimizing code by alleviating time spent in garbage collection).

**As per claims 5-6**, Coha discloses wherein the frequency depends on the rate of object creation (e.g. *rate* - para 0038, pg. 3; para 0056, pg. 4; para 0047, pg. 3; para 0054, pg. 4), the heap fragmentation, the size of the heap ( para 0067-0068, pg. 4 – Note: heap usage and unreferenced data therein reads on amount of fragmentation of garbage collectable data and freeing– see para 0032, pg. 2), and the garbage collection policy ( para 0042,pg. 3); wherein the Java computer application program is changed (e.g. step 260, Fig. 2A) by reducing memory from a footprint (para 0064, pg. 4; Fig. 2A) of the Java computer application program.

**As per claim 7**, Coha discloses wherein given the amount of memory to be reduced from the footprint(Fig. 2A), a total duration for a run (Fig. 3-4), and how much of the run is spent in garbage collection ( para 0039, pg. 3; para 0059, pg. 4), the number of additional transactions that can be computed during the run is determined ( para 0050-0064, pg. 4; para 0023-0030, pg. 2).

**As per claim 8**, Coha discloses a *verbosegc* (para 0031, pg. 2).

**As per claim 10**, Coha discloses computer system capable of running a Java program by a Java Virtual Machine, comprising:

a garbage heap associated with garbage collection events, wherein garbage collection events have an average duration and frequency (e.g. para 0037, pg. 3; para 0058-0059, 0063, pg. 4);

instructions for estimating changes in performance (Fig. 3; para 0040, pg. 3; Fig. 5; para 0069, pg.4; para 0076-0077, pg. 5) resulting from modification of the Java application program using information obtained about the garbage collection events ( e.g. *user may then change the value ... user can change the JVM ... desired heap parameters* - para 0041-0049, pg. 3-4); and

instructions for modifying the Java computer application program, wherein the cost of garbage collection to program performance is estimated using a duration of an average garbage collection event and a frequency of garbage collection events (e.g. para 0037, pg. 3; para 0058-0059, 0063, pg. 4).

**As per claims 13-16**, refer to corresponding rejections as set forth in claims 3, 5-8 respectively.

**As per claim 17**, Coha discloses a computer program product in a computer readable medium for improving performance in a Java computer application program executable by a Java Virtual Machine, comprising the steps of:

first instructions for obtaining information (e.g. Fig. 2A; para 0023-0031, pg. 2) associated with garbage collection;

second instructions for deducing changes (e.g. Fig. 3; para 0040, pg. 3; Fig. 5; para 0069, pg.4; step 250 - Fig. 2B; *accounting for changes, assumptions* - para 0075-0076, pg. 5) in performance that will result from modifying the Java computer application program, wherein a cost of garbage collection to program performance of the Java computer application program is

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estimated using a duration of an average garbage collection event and a frequency of garbage collection events (e.g. para 0037, pg. 3; para 0058-0059, 0063, pg. 4);

wherein the Java computer application program is changed by deducting memory (Fig. 2B- Note: running a instance of GC reads on deducting memory) from a footprint of the Java computer application program.

**As per claims 19, 21-23**, refer to corresponding rejections as set forth in claims 2-3, 5, 7, 8 respectively..

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4, 12, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable under Coha et al., USPubN: 2003/0182597, in view of Sumit Chawla, 'Fine-tuning Java Garbage collection performance', 01 Jan 2003, pp. 1-10; (hereinafter Chawla - url: <http://www.128.ibm.com/developerworks/ibm/library/i-gctroub/> ).

**As per claim 4**, Coha discloses parameters on heap analysis (timing information - Fig. 2A, 2B; Fig. 4) for a chosen garbage collection execution (e.g. para 0042-0043, pg. 3) hence has disclosed that the duration depends on an amount of garbage that must be cleaned up (e.g. para 0023-0030, pg. 2), an algorithm used to do the collecting or copying, a heap compaction (para 0074-0077, pg. 5 – Note: simulation by using dynamic heap behavior information for improved

collection of unreferenced data reads on selecting algorithmic approach for better compaction or a cost of reconciling object references that are moved.

But Coha does not specify that such duration of garbage collection depends on a number of finalizers that must be executed. The concept of garbage collection being delayed and timely affected by negative impact created by the concurrent *finalizers* processes was a known concept considered by many heap compaction and JVM runtime optimization techniques and this is disclosed in the *verboseGc* -based method by Chawla ( e.g. *allocations inside the finalizers* - pg. 6, avoid *finalizers* - pg. 9). Based on Coha's study to obviate the duration and frequency of garbage collection via repeated simulations ( see Fig. 2, 4, 5; 0023-0030, pg. 2), it would have been obvious for one skill in the art at the time the invention was made, in view of the *verboseGc* tool by Coha, to also put under consideration the negative effects of finalizers execution in a way to obviate their usage -- as taught by the warning by Chawla; because the additional time consumed for the garbage collector to keep track of the un-predetermined memory allocation changes happened inside the *finalizers* by way of their internal operations can affect the attempt to improve resource intent for a concurrent garbage collector as endeavored by Coha (see para 0052-0063, pg. 4); that is, the garbage collection time thereof would be unnecessarily elongated because of the finalizers as put forth in Chawla's recommendation as to avoid *finalizers*.

**As per claims 12 and 20**, refer to the rationale of rejection as set forth in claim 4.

#### ***Response to Arguments***

6. Applicant's arguments filed 5/07/07 have been fully considered but they are not persuasive. Following are the Examiner's observation in regard thereto.

**35 USC § 102 Rejection:**

7. Applicant has submitted that Coha teaches not modifying a Java computer program but rather a runtime (JVM) environment ( Appl. Rmrks pg. 6, top half). A runtime in a JVM environment entails code that can either be executed or interpreted. Since the claim only mentions about modifying a Java application program, which Coha also discloses (see para 0032, pg. 2), any memory-related and user-based modification to that runtime reads on modifying such application, absent any specifics in the claim about how the very step of modifying is implemented. As a consequence to the effect of parameters being changed by the users (see Coha: para 0043-0045), the memory for the runtime of the targeted application would be enhanced, thanks to Coha's analysis of the information resulting from a simulator tool. It is therefore earnestly asked **how the language of the claim directly teaches** an explicit and substantial form of modification to the very code ( e.g. intermediate Java constructs) being interpreted at a JVM level **in that** this very code modification would convincingly and necessarily negates Coha's modification of memory parameters for the above runtime. Not a single step in the claim reasonably conveys a code being added, removed, or replaced so that such particular action ( of code modification) would read away from Coha's user-based readjusting of parameters to garbage-collection oriented simulation and runtime of the Java application of Fig. 2A. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

(B) Applicant has submitted that the cited reference fails to teach or suggest any type of garbage collection *cost estimation to the performance* of a program; but instead runs a simulation



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with fine-tuning of GC parameters (Appl. Rmrks pg. 6, bottom). The key to interpreting this 'cost estimation to the performance' limitation has been as follows: any resources that are analyzed or monitored to help support a critical consumption analysis (in regard to how the application at runtime would be affected thereby) and a subsequent corrective adjustment would read on a form of cost (to a performance) if no analysis or proper corrective adjustment is made. Therefore, when Coha simulator-based parameter adjusting is founded on analysis and trial results derived from how heap activity or garbage collection behave, any stage of such viewing and reassessing of runtime resources consumption or utilization **reads on** assessing a cost. By assessing what to do based on such results -- e.g. per graphical viewing, the act of estimating (Note: example of plotting results and numericals as observed from Fig. 3-5 reads on values being estimated) about how the performance would be jeopardized has been construed, i.e. a cost per stage of simulation has been estimated --via such simulation plus viewing-- in order to provide some stage by stage incremental fine-tuning. In all, Coha has provided teachings in a form of an equivalent functionality (not directly in terms used but in function) to that of 'cost estimation to the performance'. For one skill in the art working with optimization of program runtime resources, it would be very hard to disassociate *cost estimation* (against performance) from resources consumption analysis when the bottom line endeavor in both cases is to see how much can be improved based on analyzing how (environmental) resources had affected or had cost the performance of such runtime. In all, the above limitation has been met because garbage collection results being key to Coha's memory readjusting -- subsequent to the above cost analysis (refer to Rejection). Absent any further specifics IN THE CLAIM about how a cost estimation is implemented, it is deemed that Coha has fulfilled in an anticipatory manner the

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limitation in question. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

(C) Applicant has submitted that Coha does not teach this garbage collection (GC) and estimation in light of 2 factors: *duration of* GC event and *frequency* thereof. From one skill in any useful arts or scientific analyses, the presentation of tabular data or graph wherein a time-based succession of events or data exhibits interval(s) between the events with respect to a range of time can only convey but at least 2 pieces of information: how frequent these events are presented or seen during that time span on the plotting or graph; how much data (e.g. thickness of plotting points, length/thickness of such sequence of pixels, intensity in either coordinate axis) has occurred during the time where they are perceived to have occurred. Therefore, it would be virtually impossible to disassociate (as in acknowledging one but ignoring the other) **intervals** between observed events and the **frequency** at which these events happen on the time-axis of the graph; nor is it effortless easy to ignore (as in absolutely being uninformed of) the intensity or thickness of such data as it happens on the graph, i.e. duration of such thickness representing such time duration of event. Therefore, as GC routines (see Coha: para 0037, 0059, 0063) are collected as graph data, the duration per such routines as well as the frequency of such routines are disclosed. Applicant's stressing on a missing 'frequency' is therefore misplaced, along with any attempt to convince otherwise by providing analogies (Appl. Rmrks pg. 8, first half). That is, in light of the above analysis, both frequency of GC events, and duration of such have been matched/disclosed by Coha. For it would be inapposite to claim, for hypothetical purposes only, 'whereby the learning about frequency of an event excludes the learning about interval between

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events'; or 'whereby the learning about a duration of an event excludes the time factor or intensity with which such event is displayed or presented on the X-axis coordinate of a graph'.

The argument is therefore non-persuasive and the argument about Coha not teaching cost estimation would have to be referred back to section B.

(D) Applicant has submitted (for claim 5) the cited reference fails to teach frequency depending on: object creation rate, heap fragmentation, heap size and GC policy (Appl. Rmrks pg. 9, top). It is urged that Applicant demonstrate how the language such as 'creation of an object' would be different of a creation of anything (anything at all) as proffered by the Argument based on the cited paragraphs; and that an *object* is substantially different from that anything, even if Coha were to disclose creation of a unknown ANYTHING. Thus, Applicant's attempt to denigrate Coha's creation of memory references would be largely unconvincing, *object* being but a very broad terminology. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

(E) Applicant has submitted that (for claim 6) the cited references show no 'changed by reducing memory from a footprint of the Java ... program' (Appl. Rmrks pg. 9, middle). Footprint of a program is known as the amount of RAM which the program takes. In Coha, the parameters modifications brought forth as a result of analyzing the runtime graphical GC data in terms of modifying the memory or heap of the JVM is perceived as 'reducing ... from footprint' of the target JAVA program. Applicant has to provide evidence that by readjusting heap parameters, for example, Coha actually increases the amount of RAM resources that the targeted

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Java program is subjected under, i.e. not reducing said amount of RAM which that Java program takes. Absent in the claim of any specific implementation step as to enforce any particular reduction action, Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

**35 USC § 103 Rejection:**

(F) Applicant has submitted that Chawla 'disdains' the use of finalizers (Appl. Rmrks pg. 10) therefore the 103 rejection would be improper a prima facie case. The language of the claim does not enforce that what is recited as *finalizers* is a necessary part integral to the invention, which also is concretely and actually utilized by the invention; nor does it require that the GC analysis is actually riding of these finalizers being utilized (as a must). From the claim, there is a possibility that by using finalizers, a dependency upon of such usage might affect the duration of GC. That is, the language implicates a conditional situation - a contingency of things that together might have effect on a GC duration and/or indirectly program performance (...*duration of garbage collection... depends on a number of finalizers that must be executed*). In other words, the claim does not dictate executing finalizers THEN analyzing the duration based on the number of finalizers thus utilized. The language amounts to description of an eventuality in which finalizers are utilized as a must; which entails or suggests that otherwise, the GC might become less time consuming: if many finalizers are to be utilized, the GC time bandwidth effect on performance would be not so desirable. The rationale of 103 Rejection is based on at least one of the following: suggestion in the prior art reference, intrinsic or inherent teachings, on level of one of ordinary skill in the art, well-known practices at the time of the invention, and a

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common purpose attempted (or suggested) by the references involved (in light of the similar purpose construed from the claimed limitation). Chawla's reference precisely suggests that if significant numbers of finalizers are utilized the effect on performance would be undesirable, therefore it would be best to avoid case where finalizers must be used in abundance. The 103 rationale has used the knowledge (or suggestion) as explained in Chawla and applied it to the above interpretation of claim 4 in regard to the dependency of GC duration on this 'finalizers' utilization. The argument for not directly rebutting the grounds ( e.g. how the combination of the references would achieve adverse effects) put forth in the 103 rationale, and for clinging instead on the basis that 'finalizers' are necessary part of the claimed invention (i.e. a impermissible piecemeal analysis of ONE reference in pursuit of some unclaimed subject matter), is therefore non-persuasive. It is deemed that a proper prima facie case of (35 USC § 103) obviousness has been established.

In all, the claims will stand rejected as set forth in the Office Action.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (272) 272-3735. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571)272-3756.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3735 ( for non-official correspondence - please consult Examiner before using) or 571-273-8300 ( for official correspondence) or redirected to customer service at 571-272-3609.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Tuan A Vu', with a long horizontal flourish extending to the right.

Tuan A Vu  
Patent Examiner,

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July 13, 2007